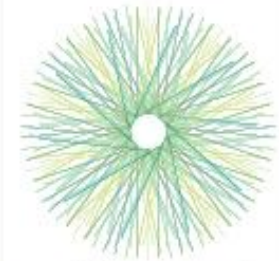
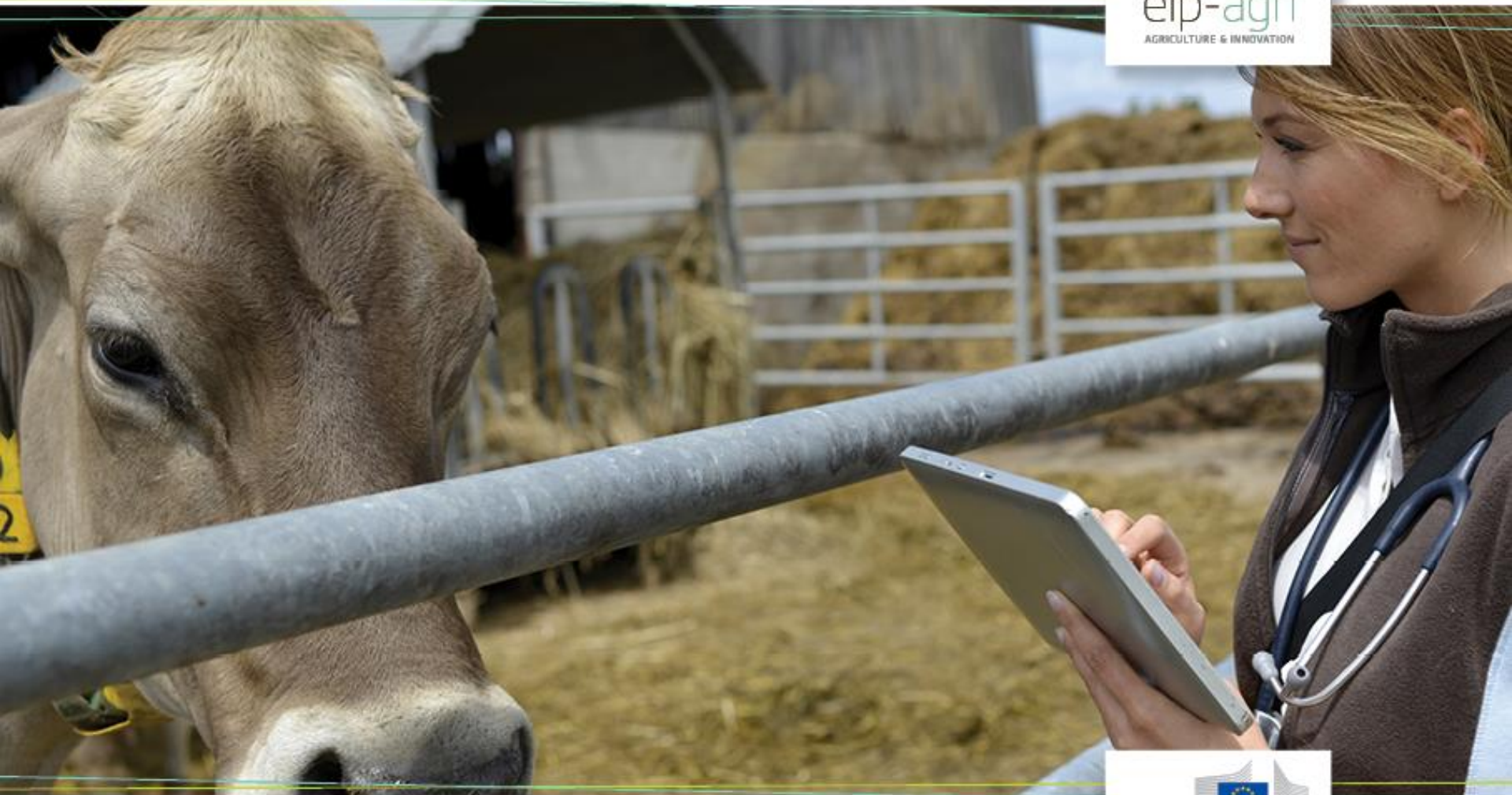


EIP-AGRI Workshop 'Biosecurity at farm level: challenges for innovation'

22-23 January 2015 – Brussels, Belgium



eip-agri
AGRICULTURE & INNOVATION



funded by





EIP-AGRI Workshop 'Biosecurity at farm level: Challenges for innovation' Friday 23 January 2015, Brussels - Belgium

Session 3: Overcoming obstacles to on-farm biosecurity improvements.

- 9:00 – 9:20** **Costs and benefits of biosecurity measures – *George Gunn, Scotland's Rural College***
- 9:20 – 9:50 Concrete examples of joint initiatives for implementation and improvement of biosecurity:
- Bovine tuberculosis in France - *Célia Lesage, GDS Dordogne (FESASS)*
 - Poultry sector in the United Kingdom - *Daniel Pearson, Aviagen Ltd. (AVEC Poultry)*
 - Improved biosecurity on Spanish pig farms by innovative rodent control - *Carlos Piñeiro, PigCHAMP Pro Europa S.L. (U.E.C.B.V.)*
- 9:50 – 10:30 Breakout sessions
Three breakout sessions on actions to overcome obstacles and to stimulate innovation
- 10:30 – 11:00 Coffee break
- 11:00 – 11:45 Breakout sessions (continuation)
- 11:45 – 12:15 Reporting from the breakout sessions

Session 4: Relating the workshop outcomes to future activities

- 12:15 – 12:30 EIP-AGRI and Horizon 2020 - *Pilar Gumma Solernou and Jean-Charles Cavitte, DG Agriculture and Rural Development*
- 12:30 – 13:00 Plenary session to discuss the group work and follow up in view of future EIP-AGRI activities
- 13:00 – 13:15 Summary and next steps - *Jean-Charles Cavitte, DG Agriculture and Rural Development*
- 13:15 – 14:00 Lunch and end of the workshop

Costs and Benefits of Biosecurity Measures



**Professor
George J Gunn**

**Epidemiology Research Unit
Inverness, Scotland
UK**



Leading the way in Agriculture and Rural Research, Education and Consulting

Introduction



- Head of SRUC Epidemiology Research Team in Inverness; Director of EPIC; SRUC Professor of Population Medicine & Zoonoses; University of Glasgow Professor of Epidemiology
- One of five leaders of European project on **BVD** control & **economics** (2003-2006)
- Led several UK level projects on **BVD** and **Biosecurity and Behaviour** (2001 – 2010)
- One of five leaders (**risk**) of European project on developing **Paratuberculosis** (Johne's disease) tests (2007-2010)
- Director of virtual Centre of Expertise on **Animal Disease Outbreaks** (EPIC) (2011- 2016)

Evolution



- Research evolved out of outbreak investigation for Veterinary Investigation Service
- BVD V potentiating pneumonia; enteritis and reproductive problems in dairy and beef herds
- Worked with Swedes, Danes and Norwegians on their BVD schemes. MSc at Guelph, Canada
- Wrote original BVD programme for CHeCS and remain on technical committee
- Research very applied How to instigate change exploring control; prevalence; economics; behaviour

BVD example

Prevalence

Brulisauer 2010
Humphry 2012
Booth 2013

People Behaviour

Duncan 2012

Gunn 2008
Heffernan 2008

WP6.1

Gunn 2002
Gunn 2005
Heffernan 2009
McCormick 2009
Gunn 2012

Toma 2008
Toma 2012

Lindberg 2006
Gunn 1994

Control

Saatkamp 2001
Stott 2003
Santarossa 2005
Stott 2008
Weldegebriel 2009

Gunn 2004
Humphry 2004
Varo 2008
Stott 2009

Economics

BVD example

1. Prevalence

Brulisauer 2010
Humphry 2012
Booth 2013

4. People

Duncan 2012

Behaviour

Gunn 2008
Heffernan 2008

WP6.1

Gunn 2002
Gunn 2005
Heffernan 2009
McCormick 2009
Gunn 2012

Toma 2008
Toma 2012

Lindberg 2006
Gunn 1994

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Gunn 2004
Humphry 2004
Varo 2008
Stott 2009

3. Disease Control

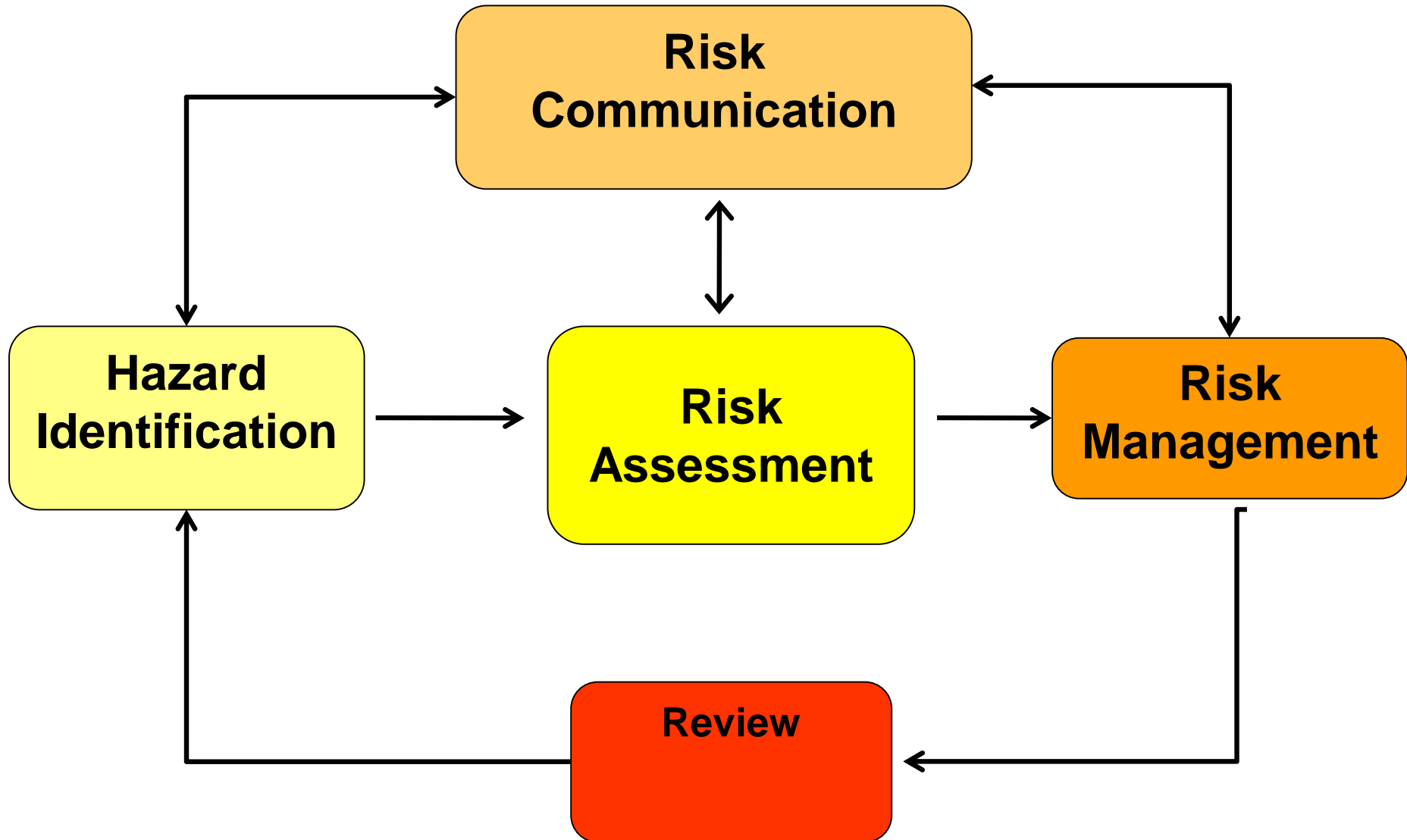
2. Economics

Vital Elements for Disease Control

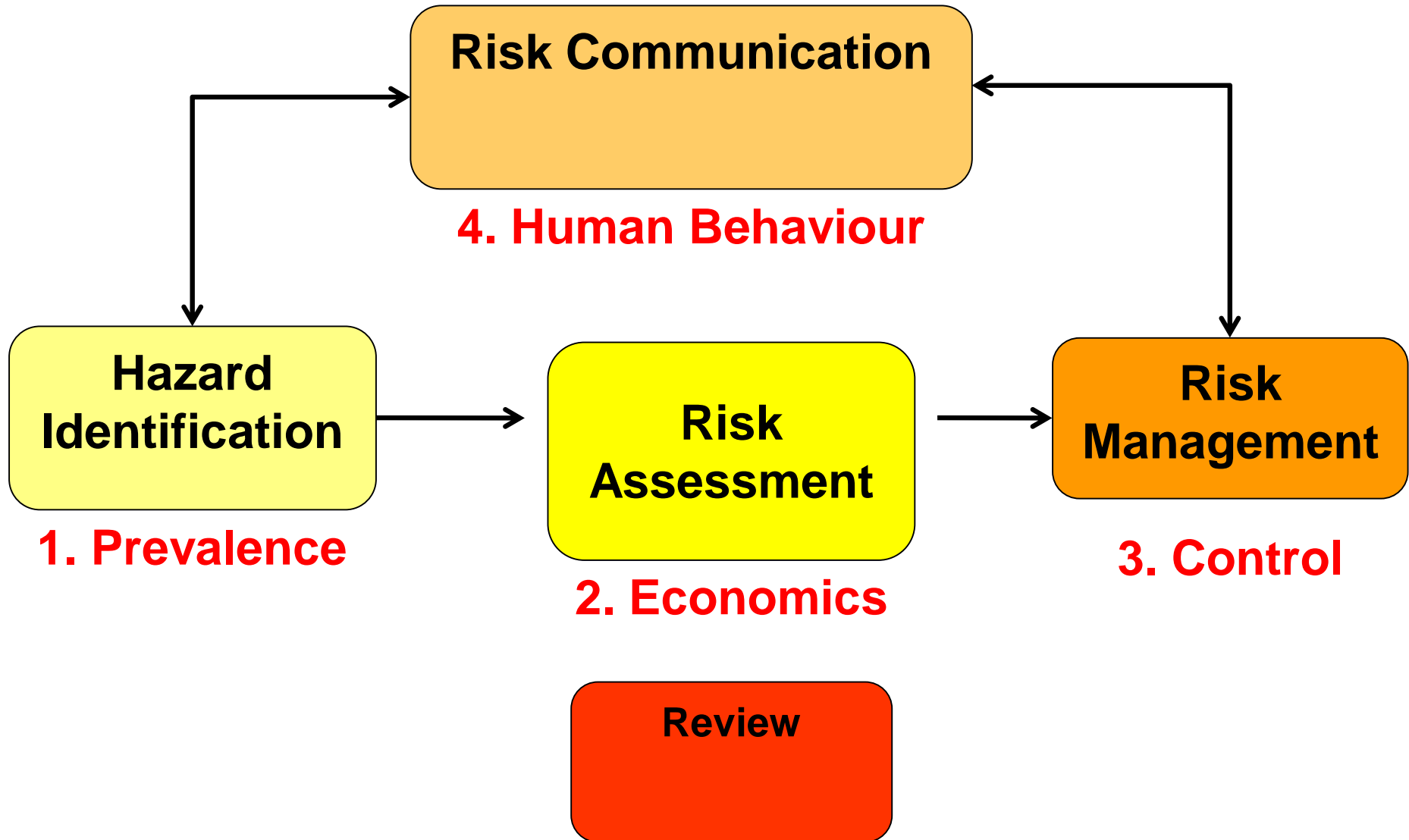


- **1. Prevalence**
- **2. Economics**
- **3. Disease Control**
- **4. People Behaviour**

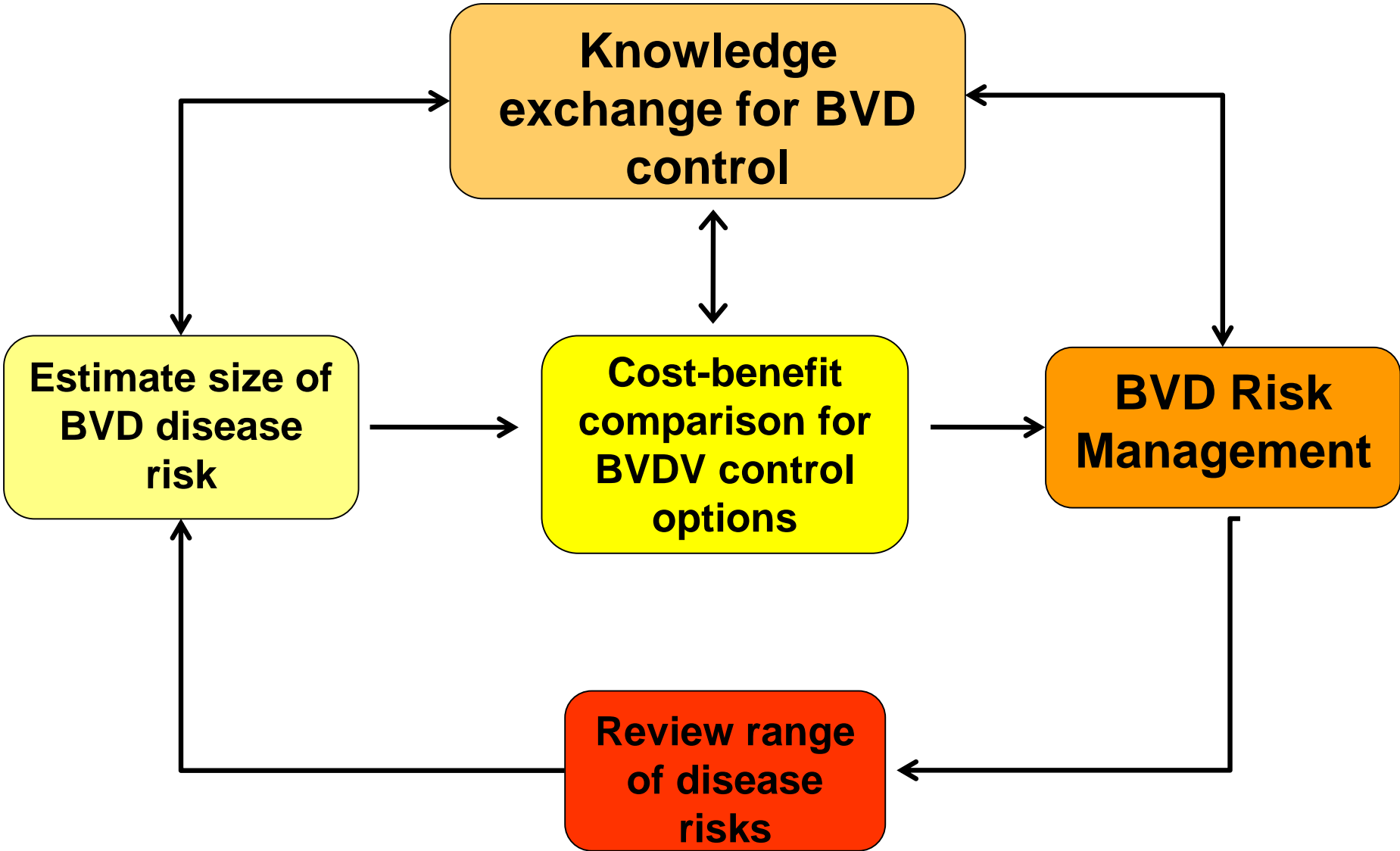
Risk Analysis - Generic



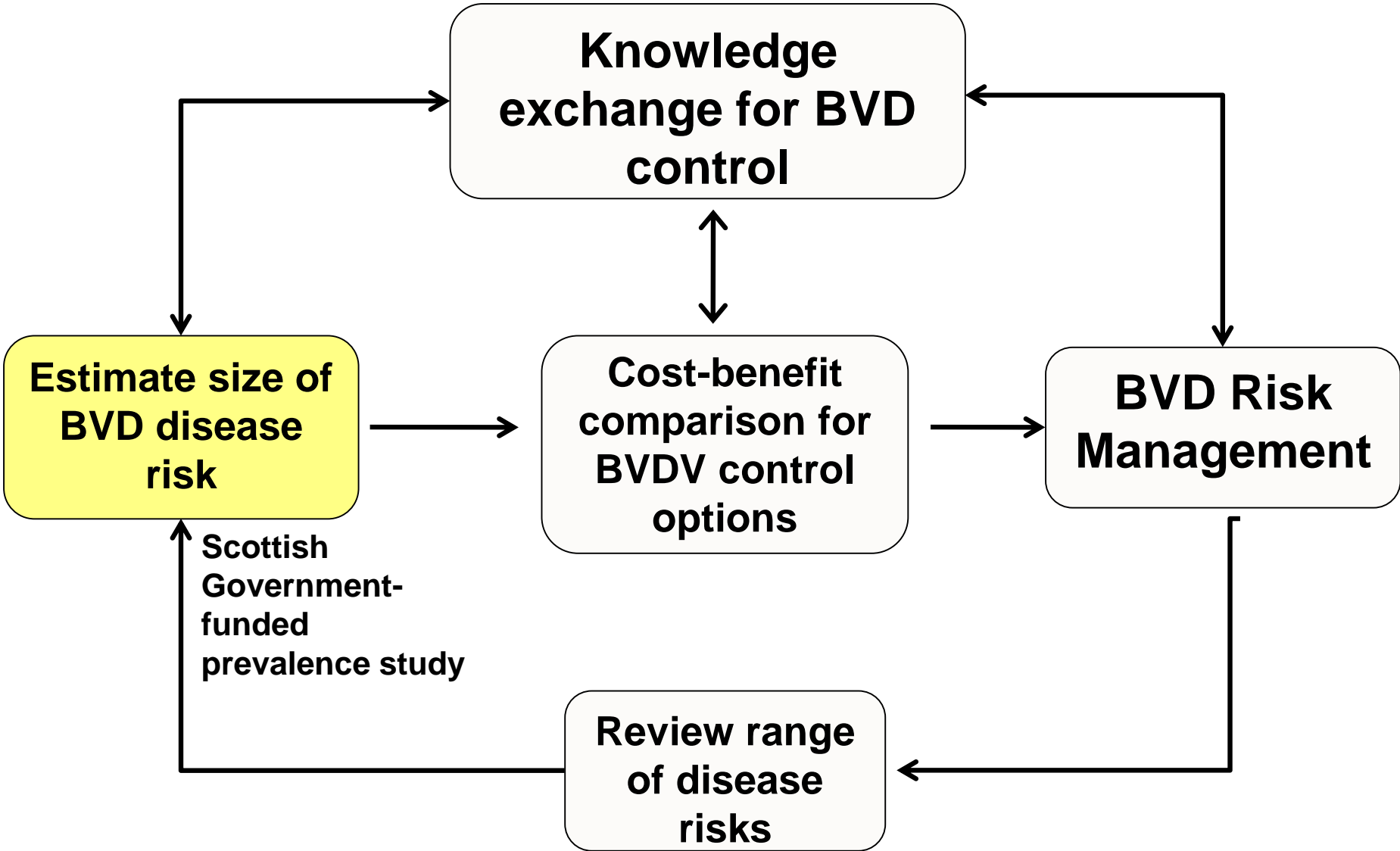
Risk Analysis - Generic



Risk Analysis & Management of BVD

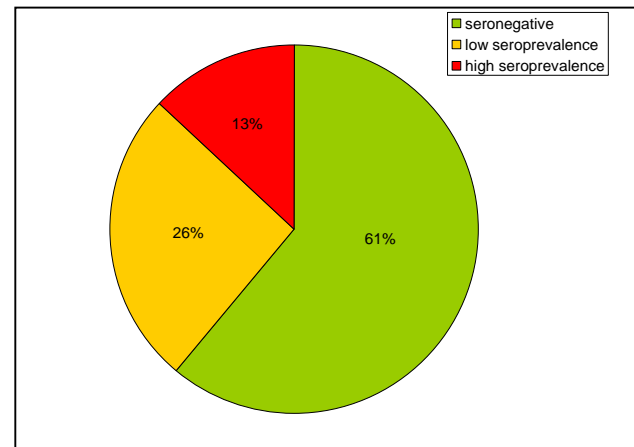
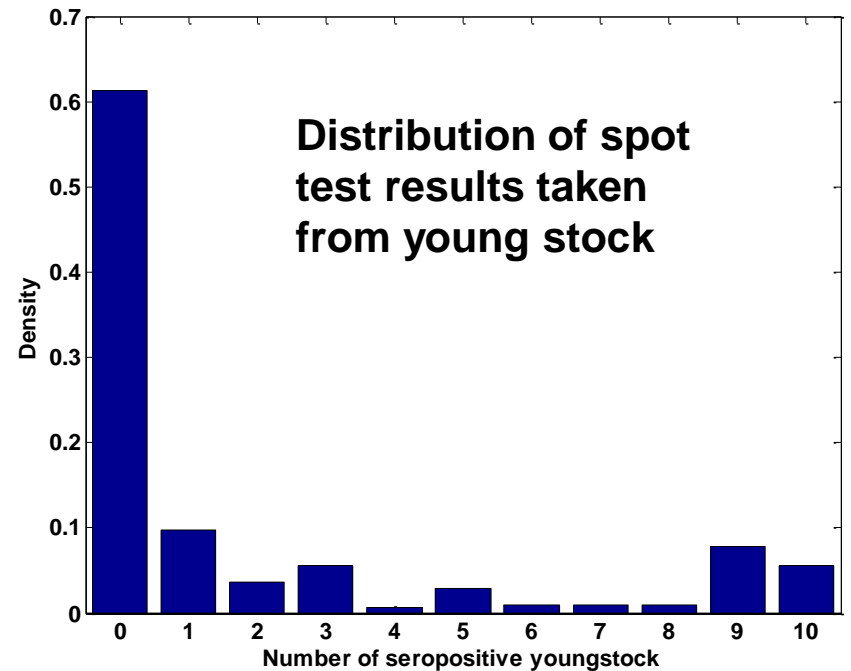
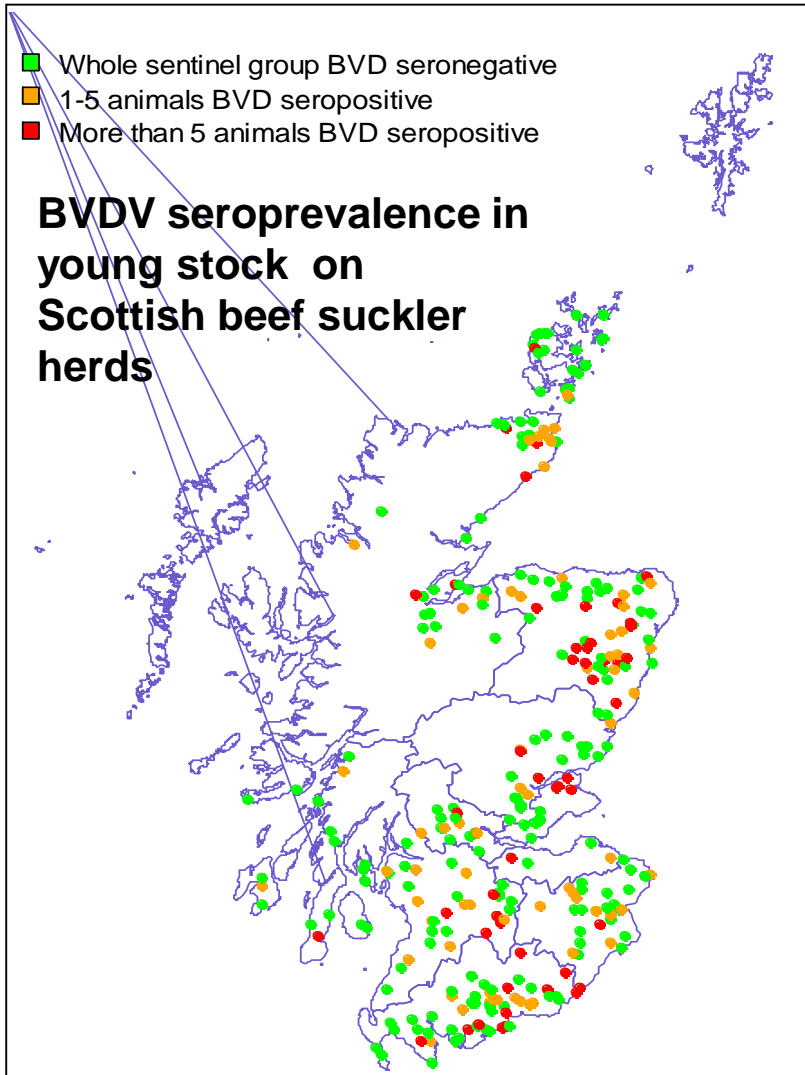


Risk Analysis & Management of BVD

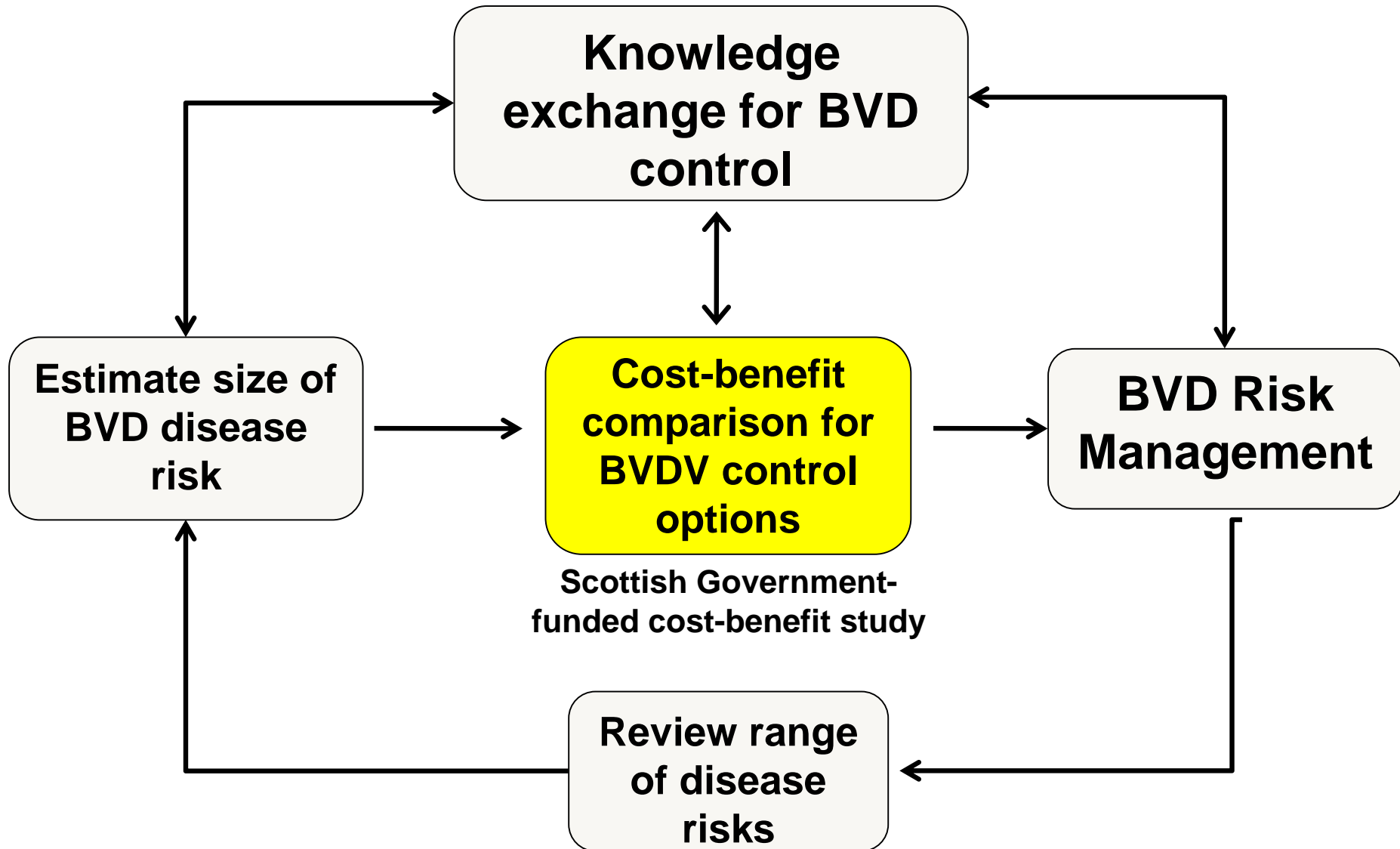


BVD V prevalence

Exposure Assessment - BVDV



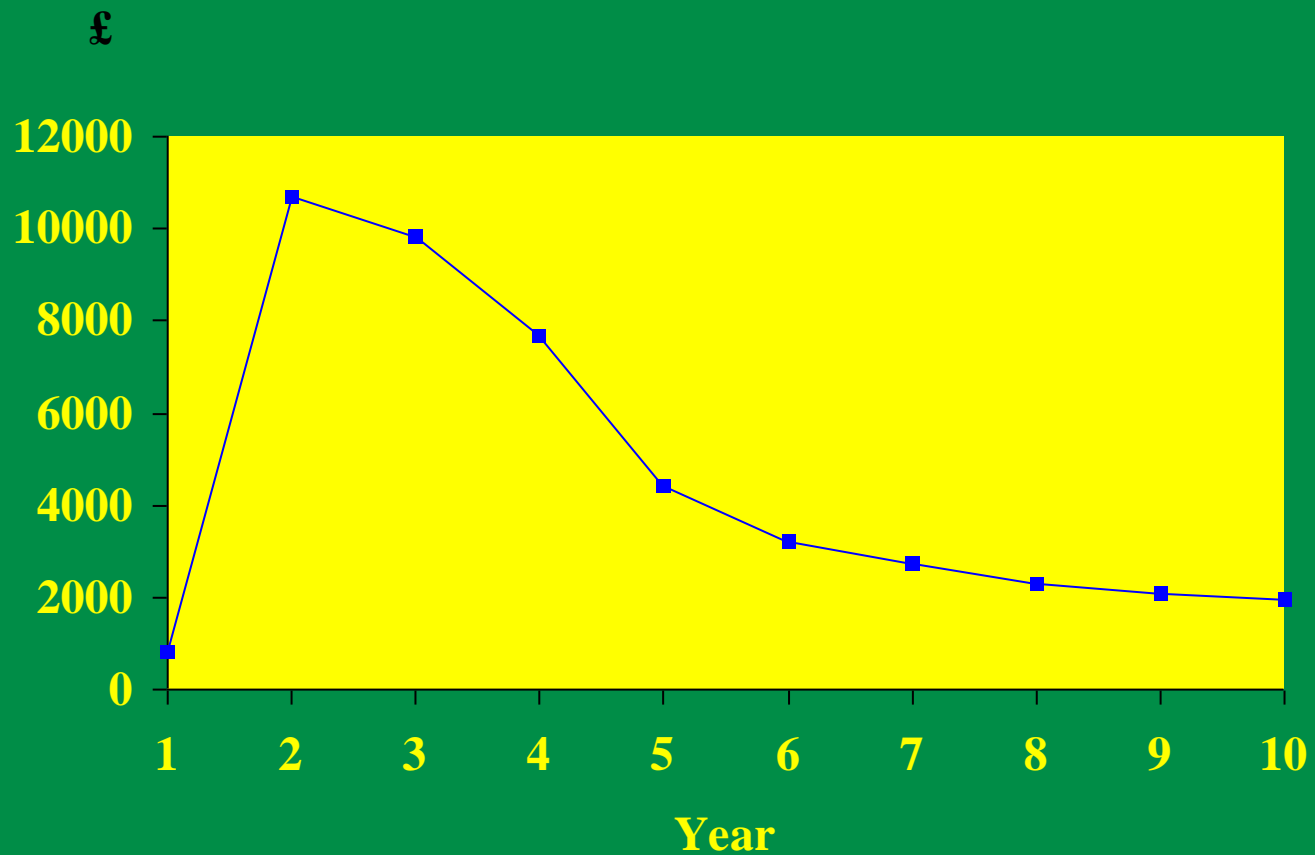
Risk Analysis & Management of BVD



Farm Level BVD Costs

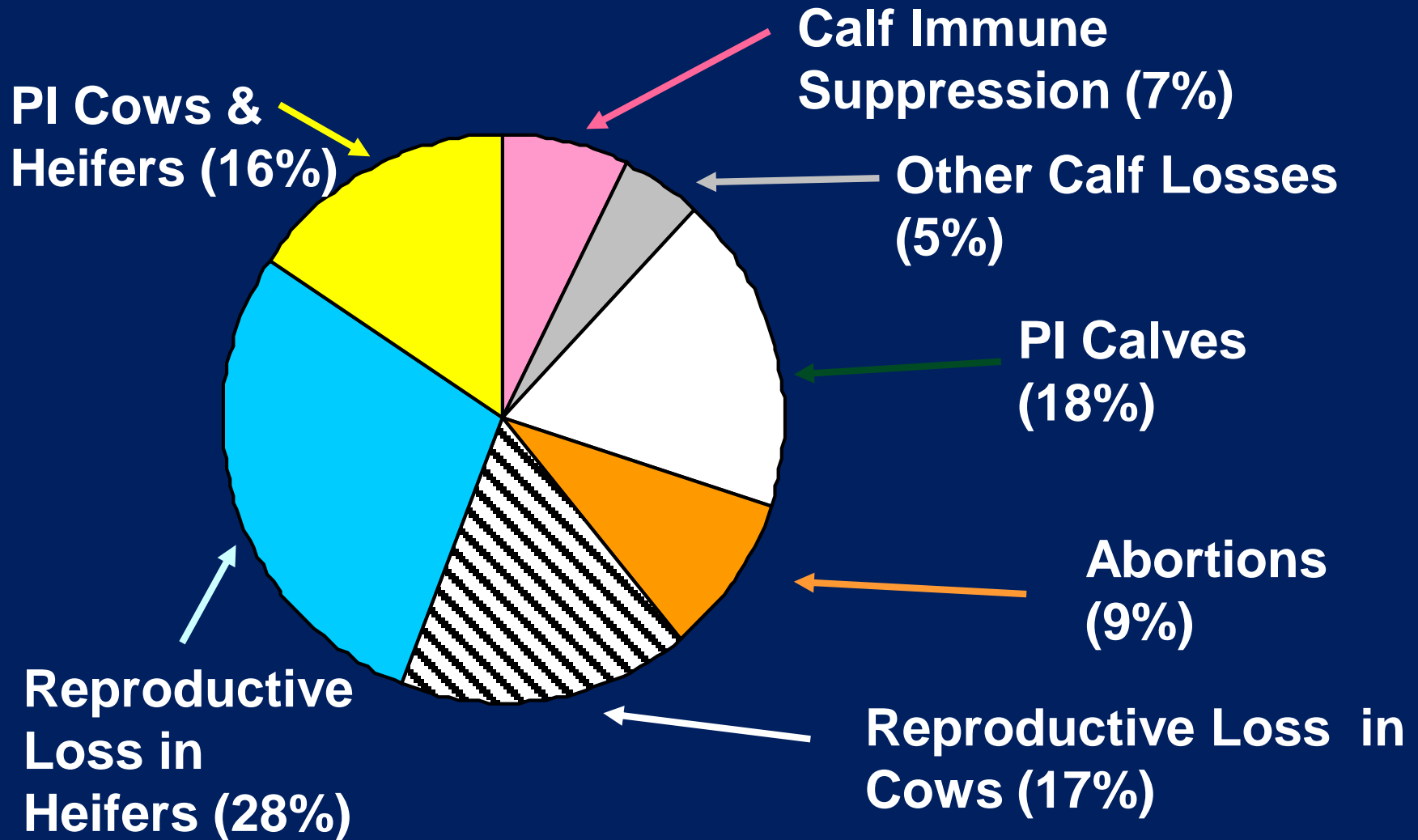
BVD Ten Year Outbreak Losses

- Beef Herd no Intervention



Beef herd breakdown of losses

Total Cost = £38 per cow p.a.

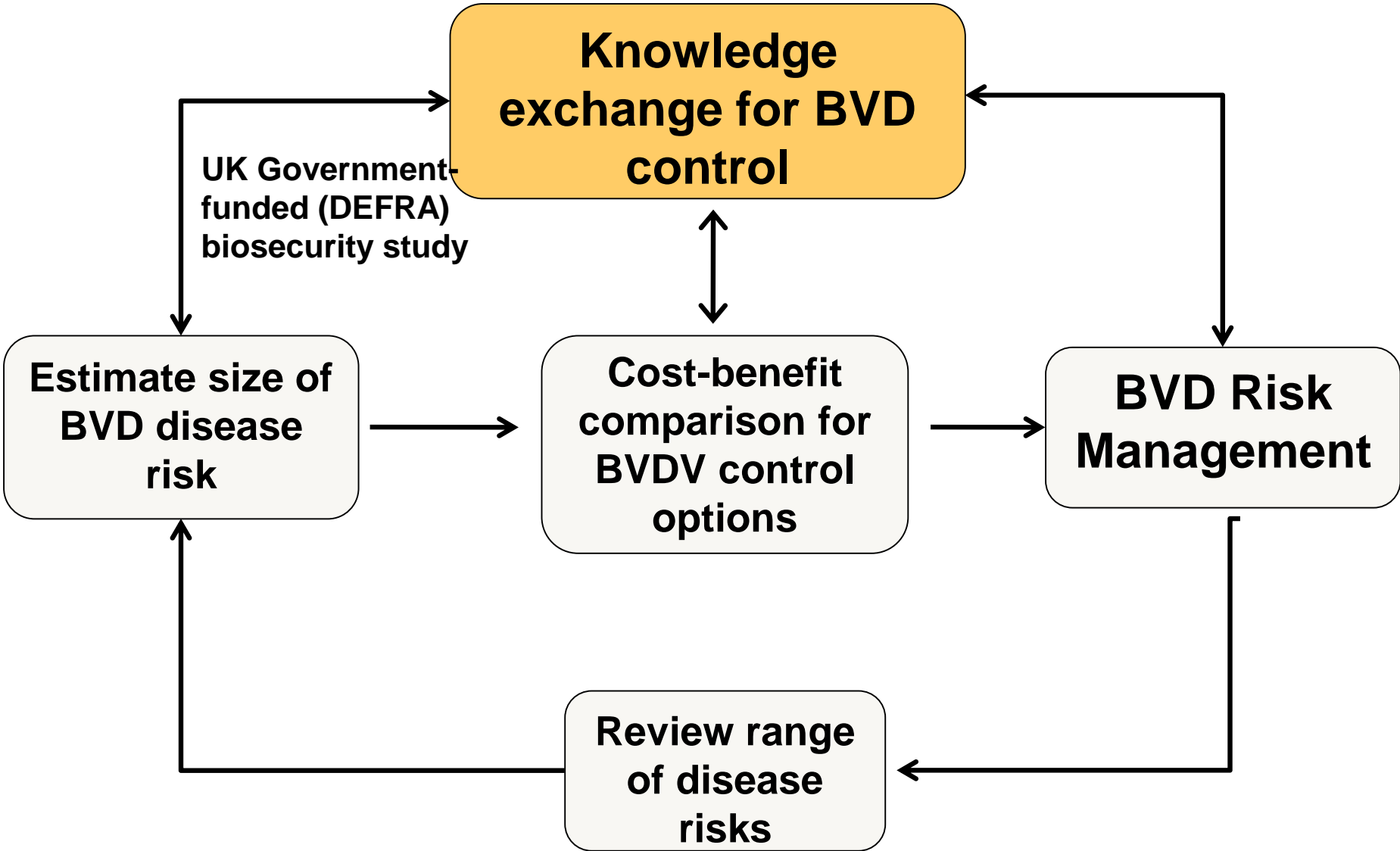


Economic evaluation dairy herd

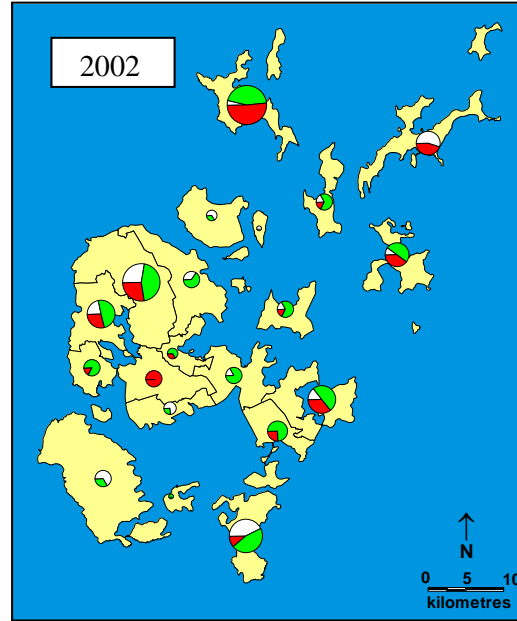
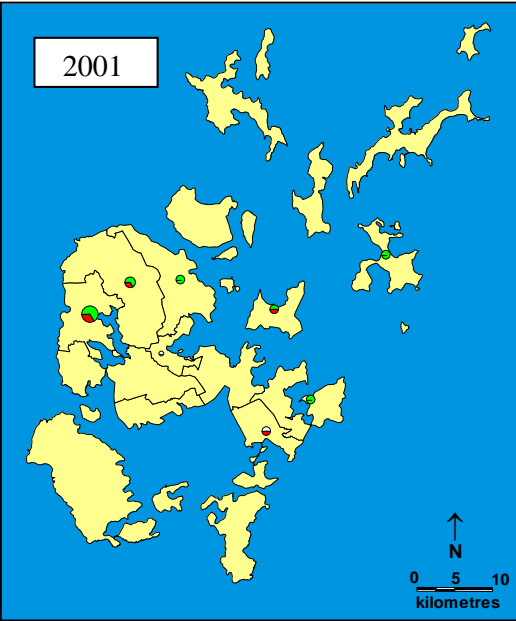


- 8% (4% - 11%) gross margin
- Cost of BVD outbreak over 10 years in large herd with low death rate for PI s and high milk price = £99K
- Range of £47K to £133K
- Cost of £33 per cow p.a.

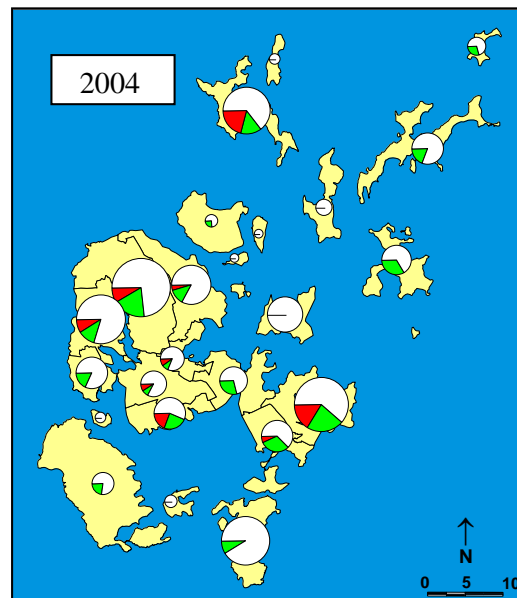
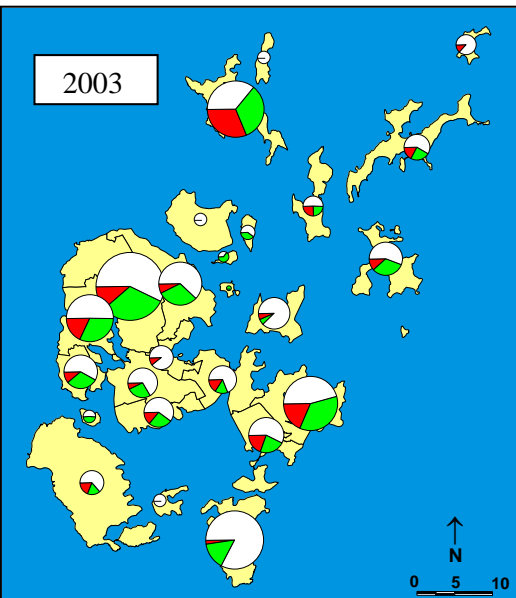
Risk Analysis & Management of BVD



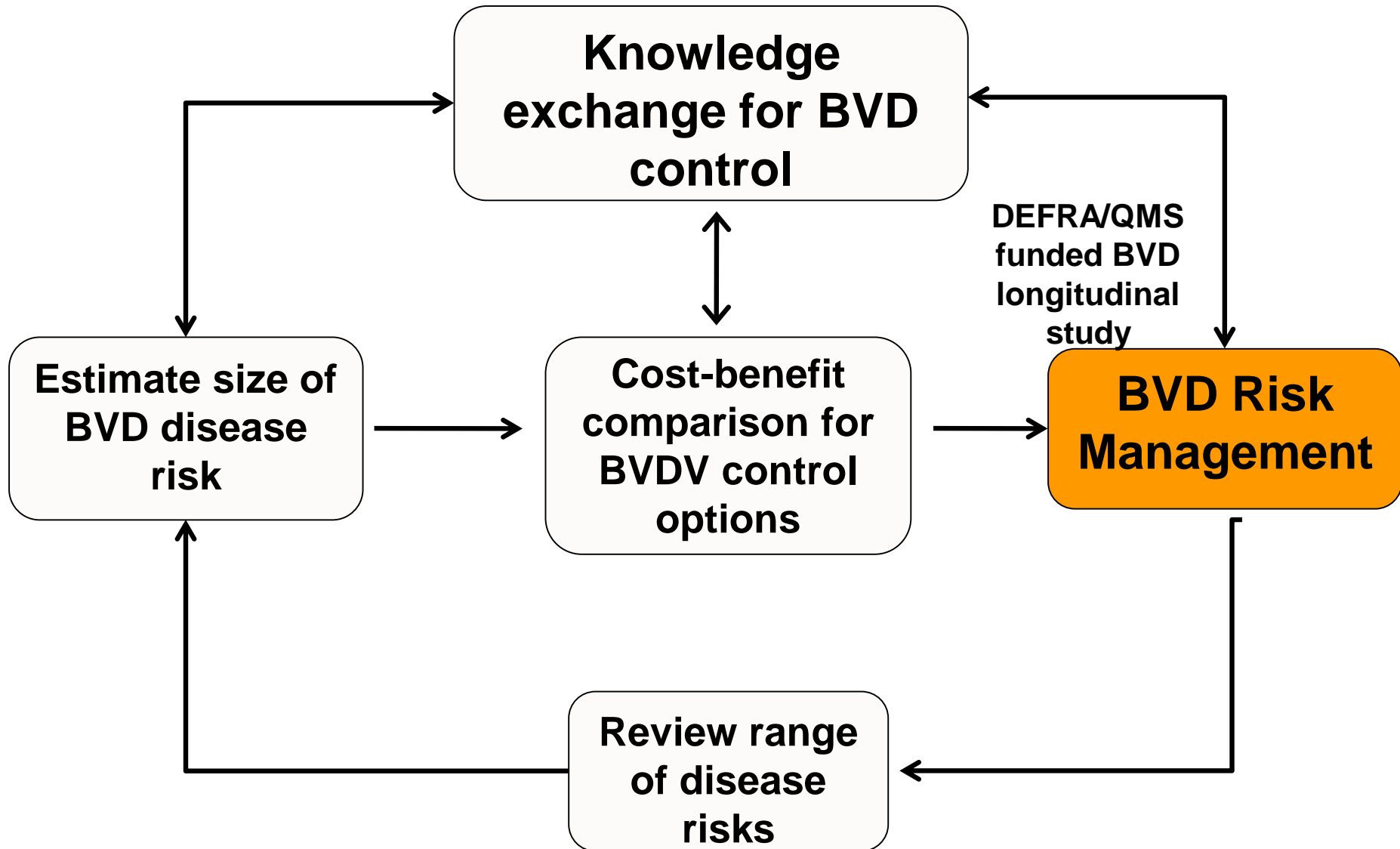
Longitudinal Survey for Control Options



BVD review of progress in Orkney 2010



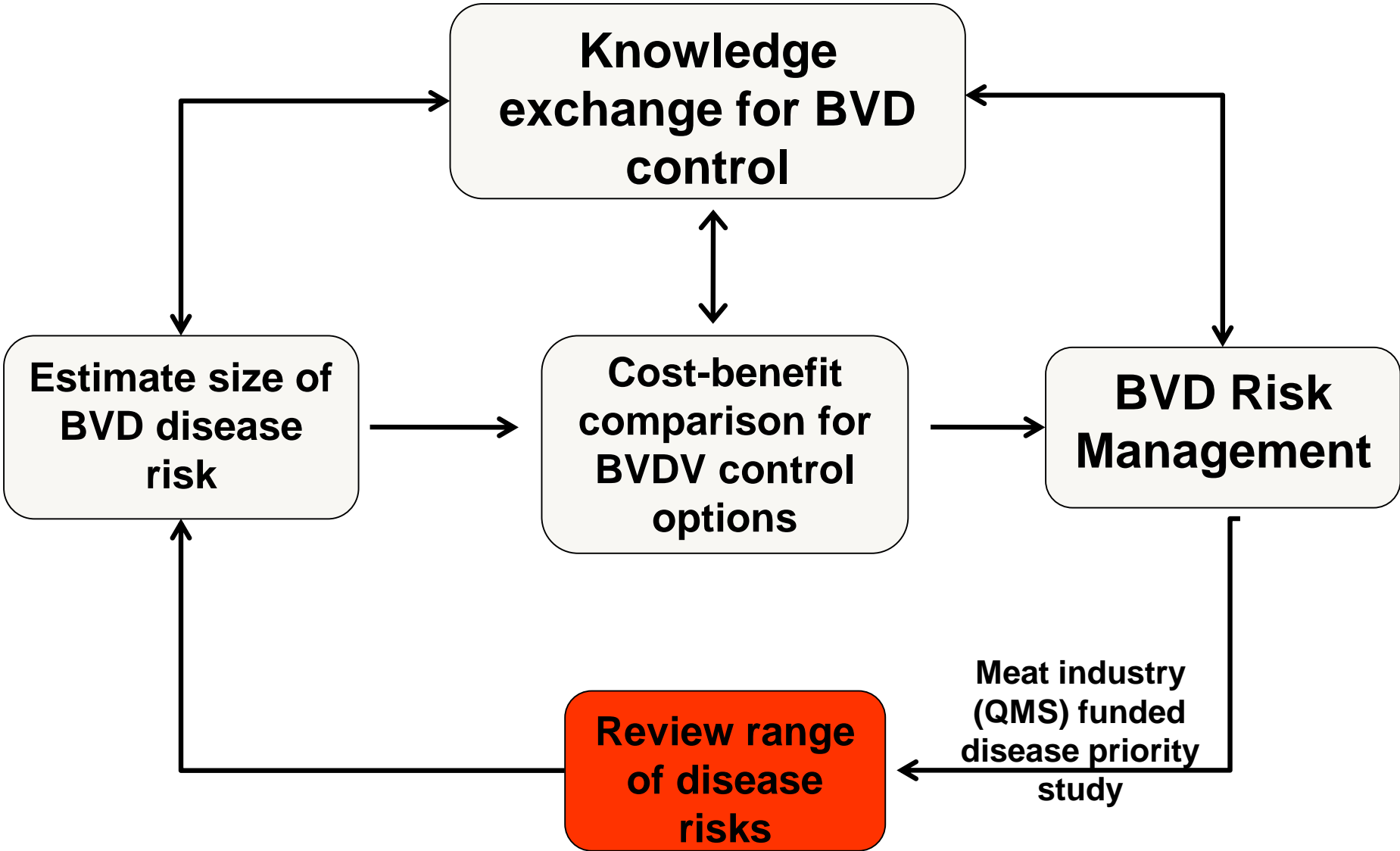
Risk Analysis & Management of BVD



Risk Management Programme



Risk Analysis & Management of BVD



Review Process

Perspectives on control of bovine viral diarrhoea virus (BVDV) in Europe – today and in the future. *OIE Scientific and Technical Review 25 (3)*

Lindberg A., Brownlie J., Gunn G.J., Houe H., Moennig V., Saatkamp H.W., Sandvik T., Valle P.S. (2006)

Farmer Behaviour linked to problems with BVD Risk Management on Farms



Vets' opinions on what barriers are:



- “Lack of understanding of BVD; ignore warnings; no biosecurity”
- “Farmers are unaware of BVD infections in their herds until screened for and they are not aware of secondary issues i.e. poor production, fertility and increased pneumonia cases.”
- “Replacement policy is key. PI's need to be removed; In 95% of farms a correctly implemented vaccination protocol will lead to, and maintain freedom from disease.”
- “Over reliance on vaccination only as control of BVD. Need for cohort sampling and awareness of ongoing cost of BVD even in vaccinated herds.”

Farmers and biosecurity: determinants of behaviour

Luiza Toma¹, Alistair W. Stott¹, Claire Heffernan², Sian Ringrose¹, George J. Gunn³

Background



- Work commissioned by DEFRA - 'An integrated approach to biosecurity on UK cattle and sheep farms; evaluating existing measures for endemic diseases against exotic threats - Extension' (2009-2010)
- Quantitative analysis of determinants of biosecurity behaviour of cattle and sheep farmers in England, Wales and Scotland

SEM results (cont.)



Overall the structural equation model explains 64% of the variance in biosecurity behaviour.

Factors significantly influencing farmers' biosecurity behaviour are

- perceived importance of specific biosecurity strategies;
- organic certification of farm;
- **KNOWLEDGE ABOUT BIOSECURITY MEASURES;**
- attitudes towards animal welfare;
- **PERCEIVED USEFULNESS OF BIOSECURITY INFORMATION SOURCES;**
- perceived effect on business during the past five years of severe outbreaks of animal diseases;
- membership in a cattle/sheep health scheme;
- attitudes towards livestock biosecurity;
- **INFLUENCE ON DECISION TO APPLY BIOSECURITY MEASURES;**
- Age/experience;
- Herd size.

What about poultry?

Catcher (chicken) survey

- At least 30% of catchers did not know what was meant by biosecurity although ~80% could describe the procedures
- Disinfection of vehicles at the farm gate, use of clean PPE, disinfection of footwear on entering/leaving poultry house (max ~50% compliance)
- Disinfection of forklift when leaving farm or factory (>90%)



Campylobacter study

- *Campylobacter* positive:
 - 47.1% pre-thin,
 - 79.9% post-thin ($P < 0.0001$)
- Analysis indicates that prior to thinning fewer negative farms and fewer positive farms ($P = 0.046$) (Sparks *et al.*, 2014)
- Canadian data: <50% compliance unless observed by camera (Racicot *et al.*, 2012)
- Medical hand-hygiene compliance rates (Erasmus, 2012)
 - Intensive Care Units = 40-50%
 - Non-ICU wards = 50-60%



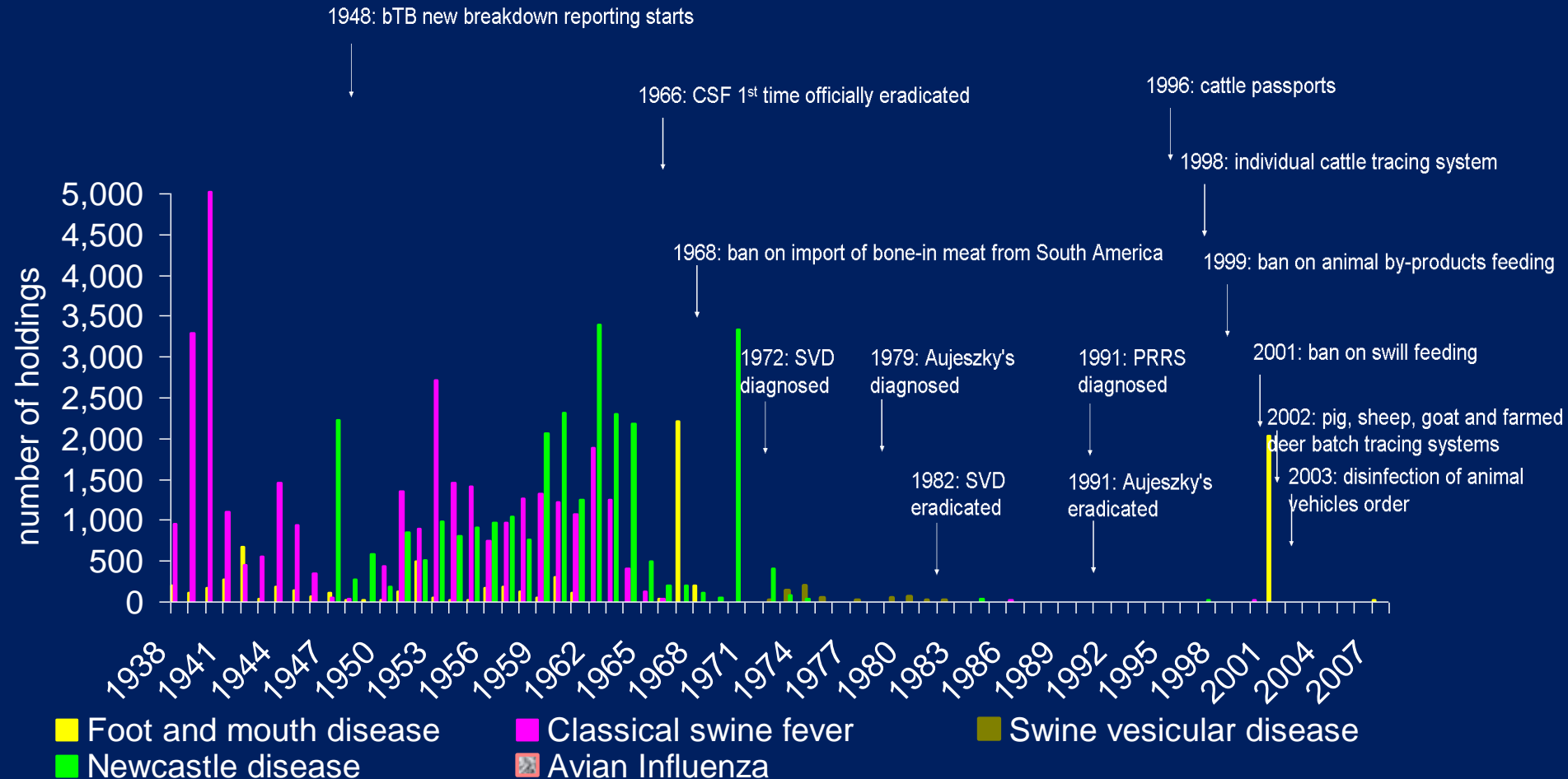
Economics of biosecurity



- For the *Campylobacter* study...
- *Campylobacter*-negative farms (at thin) had better ($p < 0.01$) FCRs than farms that were positive (1.666 vs 1.690)
- Causal or is absence of *Campylobacter* indicative of better biosecurity overall and hence reduced disease challenge?
- Either way it equates to £20/1000 birds or typically £600+/house (typical margin for a chicken farm = 2p/bird)

What about exotic diseases?

Numbers of holdings affected by diseases of the former OIE List A in GB in 1938 to 2007 and major disease control measures introduced



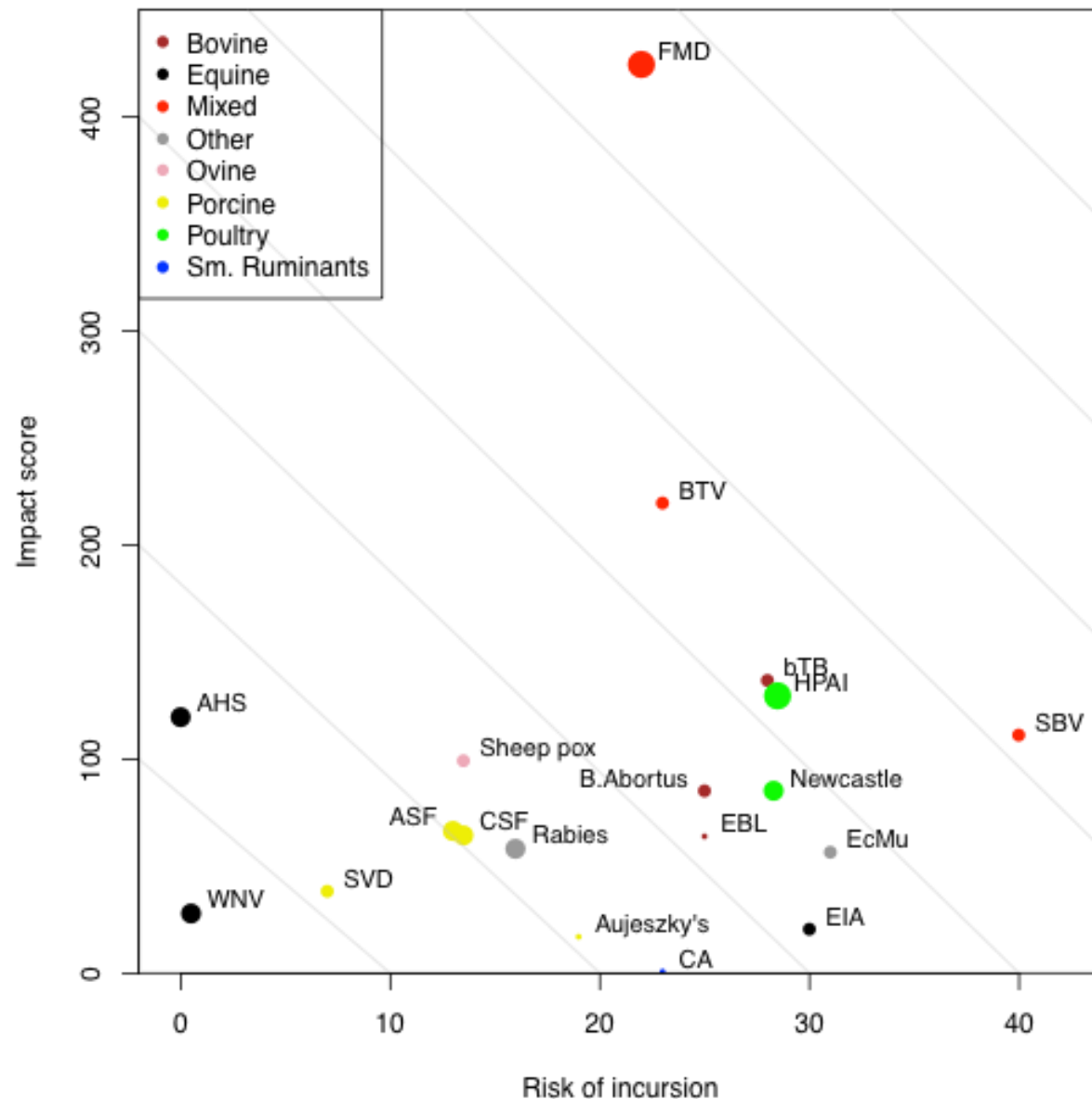
Exotic Disease Threats?



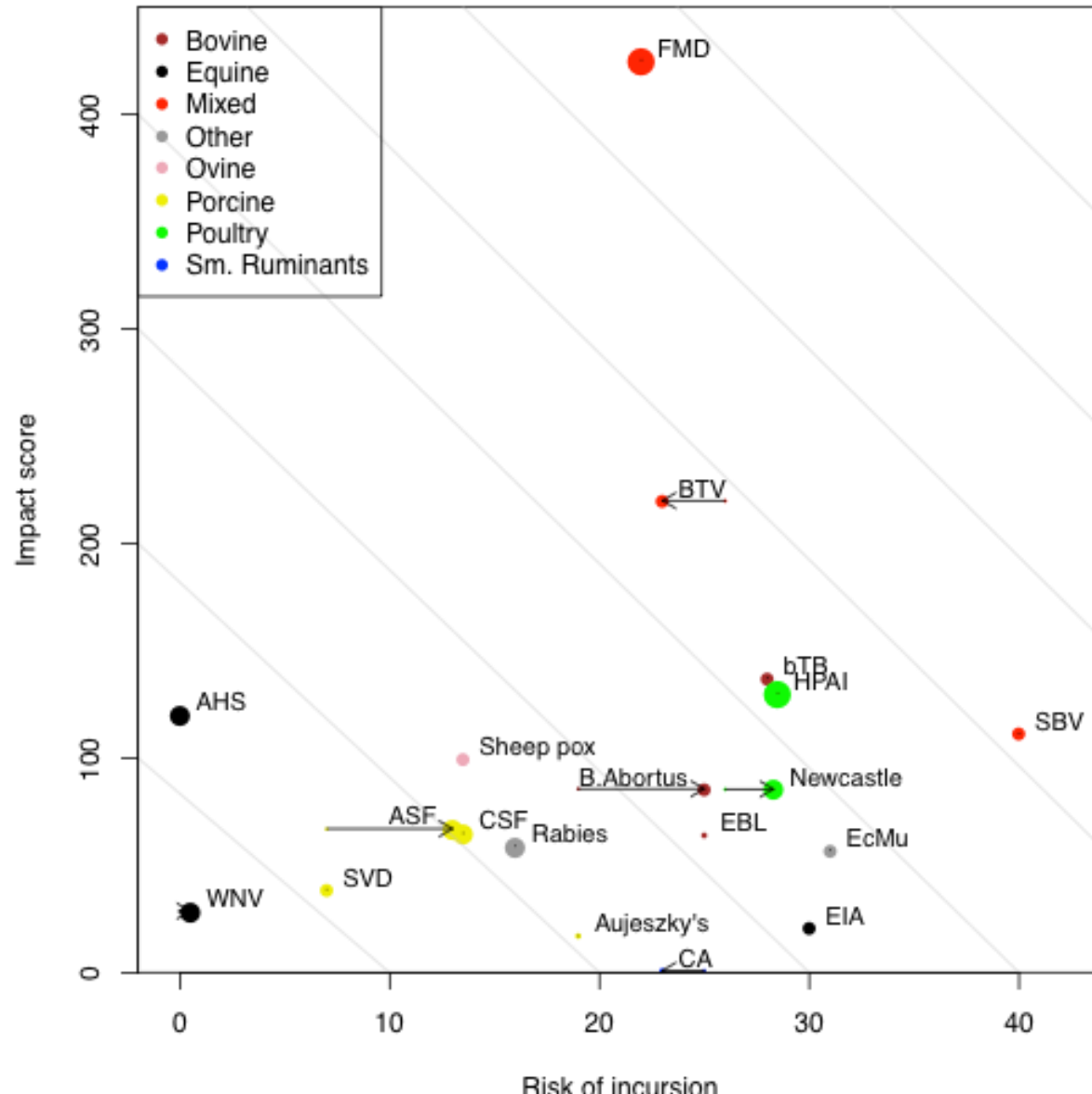
Described by: **Prevalence** x **Impact**

- Calculated for diseases identified at cattle and sheep industry workshops
- Data gathered from existing sources
- Validated with industry workshops

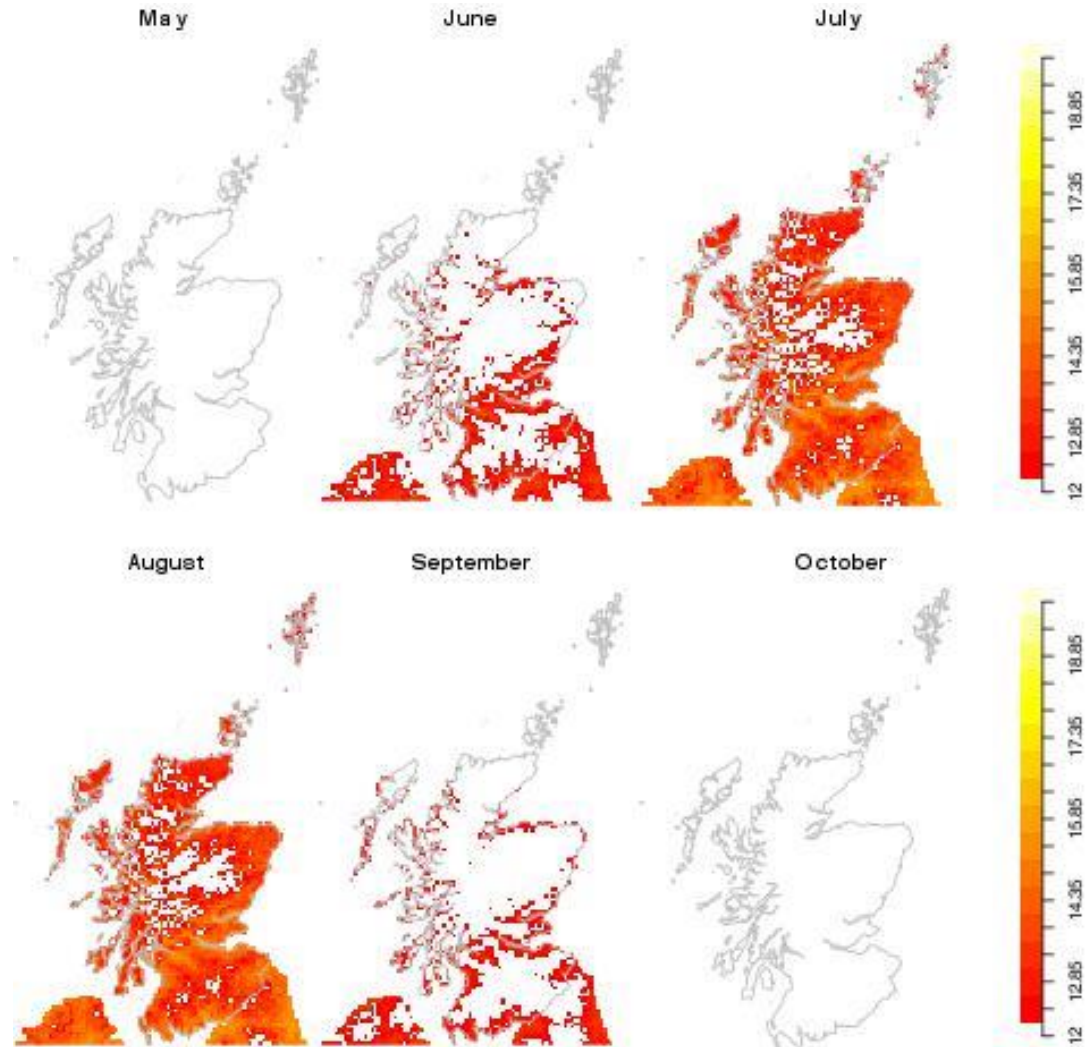
Horizon scanning matrix



Horizon scanning matrix

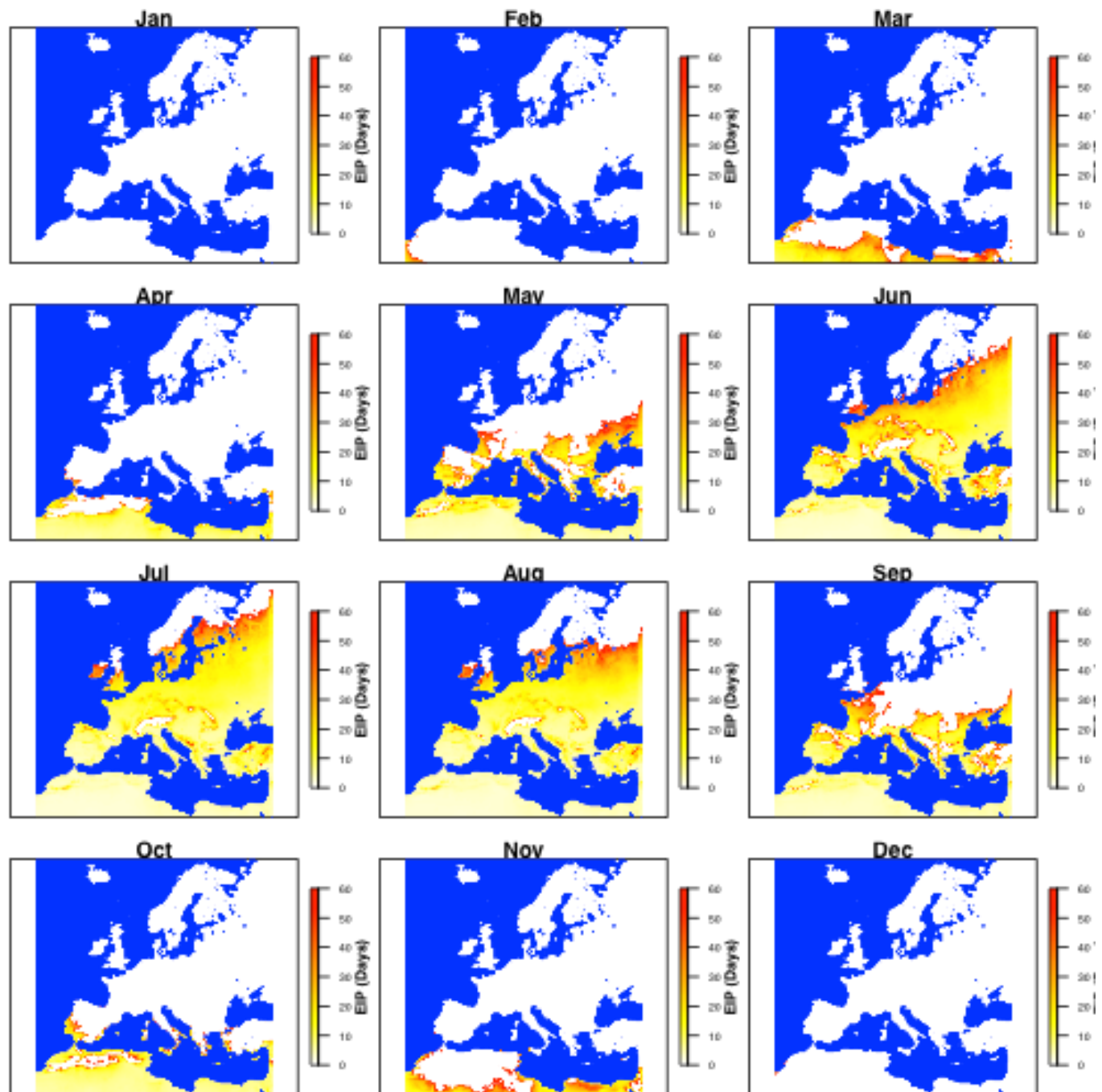


SBV Risk - A normal year



Arbovirus range limit analysis

BTV -8 bluetongue v 8



Conclusions 1



- There are a few main points from my presentation that I would like to emphasise again.
- Farmers and veterinarians often reject the concept of risk analysis but although it is something we all do every day
- We already have a great deal of information about BVD V infection with **excellent tests** and **proven control methods**

Conclusions 2



- We can all benefit from the structured framework offered by risk analysis
- It is a valuable way of organising results from complementary studies and identifying the most important knowledge gaps
- We have presented BVD V infection in Europe as an example of this

Conclusions 3 - the major points:

- Frequent review with farmers /other stakeholders **essential**
- Understanding stakeholder behaviour and biosecurity **critical**
- Reinforced need for **fantastic** knowledge exchange **effort**
- Farmers behave differently in different countries
 - find out the issues for country/region
- Our *Centre of Expertise for Animal Disease Outbreaks* **EPIC** is going to develop this **integrated research approach** for important infectious diseases



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